Direct Machining and Control

B R I G H A M Y O U N G U N I V E R S I T Y

CENTER

This Center is developing a software-based digital control architecture configured on a host computing device to control, in real-time, a distributed high speed network of motors, sensors and other I/O devices. The vision is for a PC-controlled and networked enabled direct control manufacturing environment enabling multiple machine tools to be run by one operator, through a network, rather than individual operators, delivering dramatic cost savings.

TECHNOLOGY

The DMAC technology is based on an open architecture controller and supporting control algorithms for general control of mechanisms such as 5-axis machine tools. The primary focus in the Center is software development, including object oriented libraries that integrate motion planning, trajectory generation, servo-control, communication and user interfaces, with some supporting hardware. Hardware includes dual CPU control processors, machine tool enabled Coordinate Measurement wireless hardware, and Ethernet enabled sensor boards and motor control boards. The advantage of this new distributed approach to control is reduced control hardware, control of distributed rather than collected devices, reduced control costs, and greater control flexibility through modern control methods that cannot be enabled under the restrictions of modern controllers.

ACCOMPLISHMENTS

Technical progress has continued across numerous fronts, with significant progress on new algorithms to improve direct machining performance. Direct Controls, Inc., a spin-off company in Orem, Utah, has released the first direct controlled machining robot. In addition, in ongoing commercialization work, the Center is tacking the issue of how to deliver its disruptive technology into industry and is receiving strong support from key industry players.

Recent product released by Direct Controls, Inc. is the first direct controlled machining robot

THINK TANK

What if there was...

A way to dramatically reduce the cost of manufacturing by putting control of an entire manufacturing process in the hands of one or two skilled operators, and a direct machining technology infrastructure?

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